RegiStax V3 General instructions

General: The interface of RegiStax has gone through a great deal of changes in a way to make it more user friendly. Controls that are accessible at any stage are on a top-bar section just below the window-caption. Secondly at every tabpage there is a large section with buttons/controls/settings. The next logical processing step is shown by the button with a green bar below it. Most of the special tool windows are now linked to tabs located on the right-side. The new tool windows have special characteristics, firstly they will only be visible on the tabpage they are related too and secondly they can be shrunk by pressing the arrow-button on the leftside of their blue caption-bar. The toolwindows cannot be moved outside the tabpages. More on this can be read in the controls/functions document.

Requirements: screensetting should be 1028x768 minimal.

Chapter 1. A fast Processing Run in V3

This introduces V3 and some of the new features for a simple processing session, we assume all settings to be default when starting this.

Step 1. Select your file(s)

Press the “select” button in the topbar. In the following dialog you can set the filetype you want to process (AVI, JPG, BMP, FIT, TIFF,PNG) and the files you want to work on.
To select multiple files keep the the ctrl- or shift button pressed when selecting files with the mouse button.
New in V3:
-you can also select multiple-avi files. This is a simple trick to bypass the 2Gb boundary of avi-files (remember RegiStax is still limited to 5000 frames). The avi-files will need to have a common-alignment area.
-PNG files: PNG files in many formats can be used up to 48 bit colour files (16 bit/channel).

Step 2. Set the size of the alignment area

The alignment area can be set to a 32,64,128,256,512 pixel square box. Larger boxes will reduce the registration-speed and a small box will be more difficult to align with (less features). Make sure your alignment box surrounds the area of interest (preferably a high-contrast area)
new in V3: 512 size alignment box

Step 3. Select the alignment area

At this stage you shoud decide if the current image that you see (after loading the images) is good enough to serve as a reference during initial alignment. If it’s not, use the slider on the bottom of the image display to search for another image (preferably one of the first images) that has a better quality.
After this aim your mouse-cursor at the feature you want to use as the alignment-centre. TheAlignment box will be shown when you move over the image. It’s often handy to select a feature that is rich in contrast. You can select a different area by clicking the left mouse button again. After selecting the alignment-feature the FFT-Spectrum window and the Registration-Graph window will pop-up.

Step 4. Set other alignment options

FFT-spectrum window: as in V2 you can change the settings of the FFT-alignment. One of the differences of V3 is that RegiStax sets the FFT-settings automatically. The advantage of this should be that a user is less easy confused of all options. But you can override them if you wish (see more at the explanation of this control), when changed the control will not be estimated automatically. I suggest trying to work without changing them.

Quality Estimate (controls reached by tab in side-bar or changing method):
This feature has changed quite a bit in V3, there are now 4 different methods to estimate image-quality. These can be accessed by clicking the Method options in the Quality estimate box and by the Quality tag on the side-bar.

Classic: this is the same setup as in V2 (the controls are in a separate quality-estimate window that will pop-up when you change the estimator-method or when you press the sidebar-tab). This also gets "set" automatically when you press on the alignment feature. Again manual control is possible this disables the automatic estimator.
*Human Visual:*This uses the above classic system but assigns weights to the quality-estimator based on the spatial sensitivity of the human eye. This option uses both the controls associated with the Classic option as well as a specific control for the "central" frequency (suggestion is to leave it default).
Compress: This uses a completely different system to estimate image quality. The estimated alignment-area is saved as a jpeg file (using the compression setting of the quality-window) and the size of the resulting file in kB is used as a quality estimator. This seems to work very well, at least with B/W images.
Local contrast: This estimator calculates the average local contrast in the alignment-area and saves this. Local contrast is calculated in sections of 8x8 pixels. This runs without further control-settings.

Tracking (tab in the sidebar)
Make sure that at least "Track object" is on (it is by default) and misalign warning is often a usefull setting too.

Colour (checkbox in control area)
Set to your needs. On … or Off

Step 5: Alignment

After setting controls, just press the Align button. The program will align the image-sequence, and simultaneously estimate image quality. After this has finished images with a quality (compared to the best image) less than the setting of the lowest quality (default 80%) will be rejected (unless you change their status).

Step 6: Limiting frames

This is a rather large change in processing in V3. After the alignment RegiStax will order the image-sequence according to the image quality. The slider below the image area will point at the last image of this ordered sequence that is within the lowest-quality setting. But in contrary to V2, RegiStax now allows you to decide which images will be used based on the ordered sequence. You can view the quality sequence by moving the slider at the bottom of the screen. When moving the slider further to the left you will (after pressing limit) exclude more images. Individual images may be deselected by pressing the space-bar. Finally make sure the slider is positioned on the last usable image (towards the right) of your selection. Then press the LIMIT button, the images with a quality higher than the current image that are to the left of the slider-position will be marked for processing. RegiStax now automatically proceeds to the optimize section.

Step 7. Creating a Reference Image (Optional)

Another new option in V3. Often your individual images are noisy and none of them are a perfect reference. This function allows us to create a better reference. The function is simple to use. First set the no. of frames you want to use to create a reference (between 10-50 is enough) and then press the Create button in the Reference frame section. This will start the optimizing/stacking routine for this subset of all the frames, only the best quality frames (estimated) are used for this. After stacking the procedure will enter the wavelet-section, a message will pop up that asks you to “Enhance image and press continue”. This allows you to use the wavelet-options to enhance the reference, when it looks OK press the continue-button (control bar) and the process will bring you back to the optimizing page. The new reference can now be used.

Step 8: Optimize & Stack

Either after creating a reference or directly after alignment the user can set several options (most of them similar to V2). Important are the “Search area” (in pixels) and the “Optimize until (%)” options. When optimizing, the program searches for the best shift, every run of the optimizer the maximum shift is limited by the search area. A large search area can have the advantage of finding the best image-shift in one run (but it will be slower compared to a small search area). The “Optimize until” setting will make sure that the optimizer keeps running until the %-change in successive shifts (for all images) is less than this setting. You can now press optimize (that starts a single optimizing sequence) and change settings until you feel things are OK and then go manually to the stacking page (now also green-coloured tab). Or, and this is more common, you can press “optimize & stack” which will optimize and proceed automatically to the stacking stage.

Step 9: Stack (Optional)

If you went manually to the stacking-page you can now stack the frames by pressing the stack-button. After this you can go manually to the wavelet-page. The stacking options are quite similar with V2, all the controls are again explained in the controls/functions document.

Step 10: Wavelet processing

This is the most interesting section in RegiStax since you can enhance the images using the wavelet-operators. There are many ways to work with all the controls but my advice is to simply change the settings of the wavelet-layers (sliders). When you are happy with the results, save the image in any of the formats (bmp,jpeg, fit(16/32 bit), tiff(16/48bit) and png(48bit).